Commonwealth of Massachusetts
Sustainable Design Roundtable

February 6, 2002
Meeting Notes

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Background

The Commonwealth of Massachusetts is committed to making sustainable design principles an integral part of the State's efforts to promote sustainability and sound environmental policy. To that end, the Commonwealth is exploring ways in which state actions, activities, and programs can promote incorporation of sustainable development practices into all public buildings whenever possible.

The design and construction of public schools and other public buildings in Massachusetts requires the participation of many stakeholders from both the public and private sectors. Often the process can be long and complex and the incorporation of sustainable design requirements is commonly perceived as further complicating the process.

To overcome this perception and ensure a successful sustainable design effort, an open discussion between those responsible for funding, planning, and managing public construction projects, and those who bid to design and build them is necessary. Another important part of this process is to identify some of the key barriers that impede effective sustainable design efforts and start a dialogue about what steps are necessary to address these obstacles.

To initiate dialogue, the Executive Office of Environmental Affairs (EOEA) and the Office of Technical Assistance (OTA), in collaboration with the Division of Capital Asset Management (DCAM), organized a public-private roundtable on sustainable design on February 6, 2002 at One Ashburton Place in Boston. Funding for this event was provided by the U.S. Environmental Protection Agency to the Office of Technical Assistance.

A steering committee met several times to plan the meeting. The Green Roundtable, an independent non-profit organization whose mission is to facilitate discussion around sustainable design issues, was hired to help organize and facilitate this meeting.

In preparation for the meeting, the Green Roundtable conducted a series of stakeholder interviews. (See Appendix A for the interview questions.) These interviews served two purposes: to fully determine the scope of issues that could be covered, and to identify potential participants. The information collected during these interviews helped the committee organize a constructive meeting around shared interests and concerns.

A limited number of participants were selected based on their knowledge of and involvement in the design and construction process of public schools and other buildings. A total of 54 individuals, representing 31 organizations participated. Seventeen of the organizations were private companies and 14 were public agencies. (See Appendix C for a full participant list.) To represent the many design firms that do public work, two individuals from the Boston Society of Architects, representing the Educational Facilities Committee and Public Sector Architects Committee, were asked to attend and report back to their constituents. The Steering Committee expects future meetings will allow for broader participation.

Roundtable Goal

The goal of the Roundtable was to engage both public and private sector representatives in an open discussion about sustainable design and construction practices as the first step in a long-term initiative. The nature of the dialogue was meant to focus on identification of broad strategies to integrate sustainable design strategies into existing and future programs in Massachusetts. During the course of this meeting, participants were asked to identify existing barriers to sustainable design (both real and perceived), highlight specific opportunities to address these barriers, and help state agencies determine where they can most effectively leverage internal resources to facilitate green building and green school programs. The priority of this meeting was to address process, planning, and communication issues. The organizers acknowledged that there are numerous technical issues associated with sustainable design that could not be covered but that they should be further explored in other forums.

Desired Outcomes

The planning committee established an initial list of desired outcomes for the meeting by drawing from the stakeholder interviews described previously. At the beginning of the Roundtable, participants reviewed and agreed upon the following outcomes:

- Knowledge of <u>who</u> is working to integrate issues of sustainable design and <u>what</u> they are doing so that the Commonwealth can more effectively partner with the private sector.

- A shared understanding of the perception of the problem so that all concerned can work together and focus on solving the same problem.

- A prioritized list of the most critical problems and an agreement to work on some of them in task force working groups beginning this afternoon.

- Agreement on some practical action items and next steps for an ongoing process.

- Identification of and agreement on necessary roles and responsibilities to continue the process.

Participant Introductions

Eric Friedman, Director of State Sustainability in the Executive Office of Environmental Affairs, and Gina McCarthy, Assistant Secretary for Pollution Prevention, Environmental Business and Technology opened the meeting with brief remarks. Participants were then asked to briefly introduce themselves, and describe their organization's relationship to the day's topic. Mike Williams, Director of the Office of Planning at the Division of Capital Asset Management, shared his thoughts with the group during the lunch break.

Eric Friedman, Executive Office of Environmental Affairs
Director of State Sustainability

Eric Friedman began by providing background information for the event. He explained that the Roundtable was a joint effort of the Executive Office of Environmental Affairs (EOEA), EOEA's Office of Technical Assistance (OTA), and the Division of Capital Asset Management (DCAM). He emphasized that each had an important role in creating this forum, and that each has a stake in its outcome.

Mr. Friedman outlined the state's intention to advance sustainable design as quickly and effectively as possible to address many serious environmental and health issues, ranging from climate change to the elimination of the most egregious chemicals from our environment.

He described OTA's focus on helping businesses and schools reduce toxics and hazardous materials used throughout our state and noted that OTA developed the successful funding proposal for the Roundtable.

Mr. Friedman identified DCAM as the Commonwealth's key player in the design and construction of state buildings. He defined their role as building the best buildings possible, efficiently and sustainably, while providing the best results for tenants, visitors and clients, and recognizing budgetary constraints inherent in public construction projects. Next, he recognized the team members who helped plan the day's meeting: Charlie Tuttle from EOEA, Bill McGowan and Denise Zambrowski from OTA, and John DiModica and Jenna Ide from DCAM. He also recognized Norm Willard and Cynthia Greene from the EPA Region 1 office and thanked them for funding this project.

Mr. Friedman outlined the spirit and intent of this effort – to bring together key players in the public and private sectors to explore the possibilities of establishing and growing partnerships necessary to make sustainable design efforts widespread, common and widely accepted. He

noted that all have a role to play -- agency to architect, developer to banker, engineer to designer, policy maker to technical expert -- but none can succeed alone.

Gina McCarthy, Executive Office of Environmental Affairs
Assist. Secretary for Pollution Prevention, Environmental Business and Technology

Gina McCarthy welcomed everyone and thanked them for taking the time and participating in this important meeting. She reviewed three aspects of the Commonwealth's efforts: the Clean State Program, State Sustainability and the role of sustainable design in future work.

She noted that the Clean State Program was established in 1993 as the first comprehensive statewide effort to clean and green state facilities. The program focused mostly on compliance and has had significant accomplishments, including the following:

- State agencies have addressed more than 4,000 environmental compliance matters, spending more than $250 million.
- More than 100 polluting septic systems at state facilities have been repaired or replaced, eliminating up to a million gallons of water pollution per day.
- Approximately 650 underground storage tanks, containing more than 2 million gallons of gasoline and oil, have been replaced or repaired, reducing the likelihood that local water supplies will be contaminated due to leaky state-owned fuel tanks.
- Two tons of asbestos were removed from the state Veteran's home in Chelsea. DEM has removed more than 10 tons of asbestos from state park buildings, rinks and pools.
- Lead paint has been removed from 10 playgrounds, recreational facilities, and state-owned day care facilities.
- An independent consultant has conducted a multimedia compliance audit on every major state facility.
- Most agencies have designated specific staff members to plan for and maintain environmental compliance on a consistent and continuing basis. Nearly two dozen full time environmental managers have been hired.

Ms. McCarthy emphasized that after a decade of focusing on compliance, EOEA was ready to become a leader in promoting sustainable practices and establishing a long-term sustainable vision, while integrating environmental and economic goals.

Towards that end, the State Sustainability Program has been established as the next phase of Clean State. The goal of this new phase is to promote the Commonwealth’s environmental, economic and community health while at the same time, supporting efforts that advance responsible management of the Commonwealth’s resources. The program's focus is on the activities, practices and behaviors of various state agencies.

Ms. McCarthy illustrated the Commonwealth's commitment by giving concrete examples of ongoing efforts.

- Increasing recycling efforts at state prisons, beaches, rest areas, subway stations and at a large number of facilities throughout the state.
- Ensuring that products containing mercury are eliminated wherever possible.

- Ensuring that all items containing mercury and other PBTs are recycled or disposed of properly. State agencies and municipalities are already recycling fluorescent lamps (1.5 million feet over the last 2 years) and electronic equipment (4,344 tons since 2000).
- Increasing state purchases of recycled content products, already at $68 million per year, up from $2.8 million nine years ago.
- Reducing the state's impact on climate change by purchasing alternative fuel vehicles for state agencies and through energy efficiency efforts at state buildings that, according to DCAM, has saved the Commonwealth some $114 million since 1985.

While the state has made considerable progress, Ms. McCarthy suggested that sustainable design and construction of state buildings could have the greatest impact on a wide range of environmental issues such as energy efficiency, water conservation, resource conservation, waste reduction and recycling, indoor air quality, reducing use of toxic materials, and improving the quality of our workspaces.

Ms. McCarthy recognized DCAM's efforts to hire staff to work on sustainable design, establish Sustainable Design Guidelines, and make a commitment to this process. She concluded by reaffirming EOEA's commitment to making sustainable design a cornerstone of the State Sustainability program and to putting the necessary resources into this effort.

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Brainstorm Session: Problem Perception

The first Roundtable exercise asked all participants to raise the issues they perceived to be barriers to sustainable design in public buildings. This gave everyone an opportunity to express their concerns related to legal and regulatory barriers in the design process and issues regarding quantifying and measuring performance. A total of 111 barriers were identified. (See Appendix B for full list.)

After identifying all possible barriers, the following items were identified as high priorities by participants:

- The disconnect between a building's capital costs and its operating budget creates "dis-incentives" to sustainable strategies. Costs associated with operating a building often are not considered during design and construction.
- Lack of shared knowledge about strategies and building performance.
- Lack of standards to identify green design goals in public construction and lack of a standard protocol for measuring the performance of buildings.
- Bid practices (e.g. selecting and qualifying contractors based on the low bid, using pre-qualified bidders) do not always support high performance, collaborative, and integrated design and construction strategies. These strategies require early intervention and a collaborative relationship between the general contractor and sub-contractors.
- End users don't understand the total costs of the building in the long-term. Operating costs are encountered after the building is occupied and accepted as an inevitable cost.
- Lack of qualifications for essential members of the design and construction team, who frequently do not have the required knowledge and experience.

- Social benefits of green projects have not been quantified.
- Lack of education and training for building managers and operators, legislative leadership and state agency employees. Little awareness about green design and its benefits by the general public voters and taxpayers.
- Misguided value engineering compromises quality and high performance integrated design by focusing on short-term gains at the expense of long-term benefits. Value engineering typically does not treat the building as a set of interdependent, integrated systems.
- Failure to incorporate larger scale principles, such as planning, transportation and sprawl related issues, in sustainable design.
- Lack of highly placed "champions" for green building in state agencies.
- Lack of performance based incentives or verification protocols for either public or private sector stakeholders.

Mike Williams, Division of Capital Asset Management
Director of the Office of Planning

At lunch Mike Williams provided a brief overview of DCAM's efforts to bring sustainable design and energy efficient designs and technologies to the state owned facilities that are constructed and renovated by DCAM. He discussed some of the critical requirements that DCAM upholds for the projects that it manages and pointed to the successes that the agency has had with a number of completed projects, as well as a number of those currently in study, design or construction. The central point of Mike's address was that DCAM is moving to embrace sustainable design for the Commonwealth's facilities and that the benefits of such adoption will bring positive results to the occupants and users of these facilities throughout the the Commonwealth.

Before presenting examples of a few projects where sustainable design considerations were prominently featured, Mike provided an overview on DCAM's energy efficiency programs and Sustainable Design Guidelines, citing its provisions mandating life cycle cost analyses, maximizing energy efficiency, and minimizing VOCs. Mike noted that energy modeling is increasingly being used as a tool to optimize the energy performance of building designs, and that DCAM is working in many ways to encourage facilities to maximize the energy performance of their buildings and complexes. Mike said that DCAM had accomplished energy savings projects that resulted in over $120 million in utility savings since 1984, and that existing and new performance contracts are responsible for savings in the neighborhood of $20 million annually.

Finally, Mike discussed a couple of projects in the design phase that will accomplish significant sustainable design features not previously achieved by DCAM projects. These include projects for which the agency and its consultants and user agencies are actively considering LEED accreditation. In addition to technologies that will provide optimal energy efficiency and support healthy indoor environmental quality, DCAM is more actively considering the inclusion of passive solar design, and integrated renewable energy features for which grant funds will be sought from the Mass Technology Collaborative's Renewable Energy Trust Fund.

Mike said that DCAM is committed to the incorporation of sustainable design into its routine practices and noted that the agency has committed more resources to staff and to agency training in this area. Finally, he indicated that DCAM looks forward to being actively involved in forums similar to this program and wished the participants well in their efforts to promote the sustainability agenda.

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Priorities: Categories for Working Groups

Following the identification and discussion of these barriers the participants began developing strategies to address these obstacles. The perceived barriers fell into 6 main categories that became the focus of the working groups.

1:	**Education, Awareness, and Training**
2:	**Capital Budget vs. Operating Budget**
3:	**Bidding and Awarding Process**
4:	**Sustainable Planning: Champion/Leadership/Vision**
5:	**Financial and other incentives**
6:	**Standards, Measurements and Verification***
	(* *no one volunteered to participate in group 6*)

Participants chose to work within one of the six working groups. Each group included private and public sector representatives and focused on one category of problems identified in the previous section. They were charged with the following tasks:

1. Identify key stakeholders needed to successfully address the issues.
2. Suggest actions and activities to address existing barriers.
3. For each action suggested, create a rough timeline and identify the resources that would be needed to accomplish the goal.

The results of each working group signify a starting point for future work. Discussions to establish a permanent committee to further develop these ideas will be held following the roundtable.

GROUP 1: EDUCATION

The group agreed that a barrier to all aspects of design, construction and operation of buildings is lack of education about how design decisions directly impact public health and natural resources. Whether the issue is cost, material selection, design process, performance measuring protocols, or social benefits of green design, education is a high priority.

Stakeholders Identified:

Elected officials/voters
Educators/teachers
Media
Design and construction professionals
Business groups
Community groups
Town government
Community at large/voters
School building committee
School board
Students
School Faculty and administration
State agency staff and leadership
Legislators

Barriers Identified:

- Poor access to resources
- Insufficient funding
- Media misrepresentation
- Lack of reliable information
- Lack of financial information
- Disconnects in communication
- Poor distribution of information
- Issues can be impacted by politics
- Competing priorities
- Lack of quality control for information

Suggested Actions *(* high priority item)*:

- *Provide tools and training for designers and public sector agency employees
- *Create a pilot program (based on MTPC's) for model projects
- *Develop guidance for building decision makers (including guideline/checklist)
- *Awards program – media link (sustainability awards through BSA?)
- *Implement a training development program that incorporates tools and best practices
- Integrate sustainable principles into school curriculum
- Create effective and easy to use web site links
- Educate about costs/life cycle analysis tools
- Collect well documented case studies for distribution or web access
- Perform a needs assessment in both public and private sectors
- Improve understanding of School Building Assistance Program role in design and construction
- Use existing communications channels to do outreach
- Use direct mail to select groups focusing on specific issues
- Survey design firms on sustainability experience, ability

Resources Needed:

Funding for studies/research and training
Working group to determine scope and ongoing needs

GROUP 2: CAPITAL VS. OPERATING BUDGET ISSUE

This group discussed the schism that exists between capital, or first costs, and long term operating costs. Often, design decisions are made in a short term, first cost context, and do not necessarily consider the long term effect on the building's operation, maintenance or efficiency. The lifetime performance of the building and its systems can be compromised by short term financial considerations that do not include life cycle cost analysis as part of the decision making process. This group discussed the existing financial structure that creates this disconnect and proposed some ways of addressing performance objectives over the lifetime of the building.

Stakeholders Identified:

- Owner
- Client
- User group
- Voter/constituency
- Budget decision-makers: building committee, study groups
- Maintenance group
- Funding agency
- Utilities

Suggested Actions:

- Study ways to address the budgetary disconnect between capital costs and long term operation and maintenance costs
- Explore opportunities for privatization "i.e. Lease /Purchase"
- Maximize use of available rebate programs offered by utilities
- Establish revolving fund to support sustainable strategies (i.e. if you get it right, you get more, not less)
- Value analysis vs. cost analysis
- Target budget issues specific to new vs. renovated
- Maximize available non-project funding sources
- Identify any incentives, other than financial, that may exist

Resources Needed:

Funding for study and analysis as well as specific projects to cover initial, short term and/or incremental costs.

GROUP 3: BIDDING AND AWARDING PROCESS

The current bidding and award process does not encourage integrated design nor does it guarantee the selection of professionals most qualified to execute high performance buildings.

Stakeholders Identified:

- *Legislators
- *Procurement officers
- *DCAM
- *Construction and program managers
- *General contractors and subs
- Designers
- DOE/SBA
- Engineers
- Taxpayers
- Financial organizations
- Lawyers
- Mass. Executive Office of Administration and Finance
- Building codes, enforcement and setting standards
- Owner/client: city, town or state
- Users: state agencies, public school teachers or students

(indicates high priority item)*

Suggested Actions:

Better define the problem for all stakeholders

- Define aspects of the problem: low bid, no bidder pre-selection/ qualification, pre-filed sub bid law/requirements.
- Investigate whether to work within the system or advocate wholesale change.
- Review chapter 149 and existing construction reform initiatives to determine whether it can address concerns, or if additional elements are needed.

Identify possible solutions:

- Commission study to review other state models (e.g. CA) and compare bidding laws, cost of public school construction and the differential cost of school construction versus other construction. Identify who provides funding, how much over what period, and how compensation and/or funding is calculated. Include input from private sector (i.e., contractor who works in many states can provide feedback about relative magnitude of issues or barriers)
- Propose changes to existing system that support sustainability in finance, architect selection, review, etc.
- Provide education in many areas, including contingencies.
- Create incentives (e.g. streamlined approvals) for green projects.
- Pass legislation, SBA regulations, tax credits or other 'green' standards.

Resources needed:

Funding for studies, analysis and education

Working group – dedicated leadership and plan to craft solutions

GROUP 4: PLANNING/VISION/LEADERSHIP

This group focused on the need for a broad and inspiring vision, with solid leadership in different sectors. The vision should be broad enough to consider everything from large scale planning issues to individual buildings and how these issues relate to each other. The group also discussed what might be needed to implement such a vision.

Stakeholders Identified (Audience):

- Communities: schools, abutters to state facilities
- Students
- Agencies
- Legislature
- Developers
- Users (e.g. occupants, clients)
- Construction agencies, boards

Stakeholders Identified (Implementers):

- Governor
- DCAM

Objectives:

1. Consider sprawl issues
   - preserve open space
   - limit dependency on vehicles
   - focus on reusing infrastructure/sites over new development
   - promote preservation of existing structure; growth rings
2. Create multi-modal development (mixed use with transportation alternatives)
3. Plan transit oriented development
4. Utilize brownfields over greenfields
5. Buildings should "belong" in community (i.e. be integrated into existing environment).

Suggested Actions:

- Develop set of guidelines that demand/inform/dictate sustainable design goals/objectives that can be implemented.
- Develop statewide environmental goals and limits including: cultural/ air/water/land use.
- Link sustainable design principals to markets and economics (not necessarily subsidies).
- Clarify and develop state planning and development objectives.
- State should quantify what it already has (i.e. state owned buildings, environmental resources, infrastructure, community values).
- Foster/promote multi-use integrated projects that meet multiple needs.
- Consider how to incorporate community needs in public projects.
- Use state buildings as models for the public and other users and ensure all operating needs are met up front including costs associated with monitoring, training, publicizing information and data.

GROUP 5: FINANCIAL AND OTHER INCENTIVES:

Green design strategies can run counter to the traditional processes by which we design buildings. Analysis and research not typically done as part of public building design can be an added cost. Incentives, whether financial or other, have proved successful in motivating a shift in traditional practice. This group discussed new incentive programs and effective coordination of existing programs.

Stakeholders Identified:

- Mass. Executive Office of Administration and Finance
- Department of Education and School Building Assistance Program
- Utilities
- Legislators
- Municipalities
- Design professionals
- Contractors/subcontractors
- Public Agencies
- Communities and their reps
- Federal government
- MTC/Renewable Energy Trust

Suggested Actions:

- Better integrate/consolidate existing utility incentives to make them more user friendly. Organize school/community meetings with utilities.
- Legislative/budgeting agencies should be rewarded for reducing operations and maintenance costs and increasing productivity. Brainstorm creative incentives.
- Study the procedure at DCAM and other agencies. Are there line items for sustainable design (by %) in budget? If not, explore creating an internal source.
- Focus research on current cost of "bad" decisions (i.e. an audit of missed opportunities could be a tool to convince agencies, municipalities, SBA and legislature about wasted money) as well as life cycle costs.
- Research incentives in other states.
- Alter SBA awarding process to encourage sustainable design.
- Alter design fees to encourage sustainable design up front.
- Research funding of operations and maintenance to determine what we are doing and what works.
- Explore marketing incentives for sustainable design and maximize them.
- Get a better understanding of non financial incentives (from time, schedule, legal restrictions to process efficiency)
- Consider offering performance bonuses above and beyond standard fee. The federal government has had success with this.

Resources Needed:

Funding for research and analysis.
Task force or working group to carry out work.

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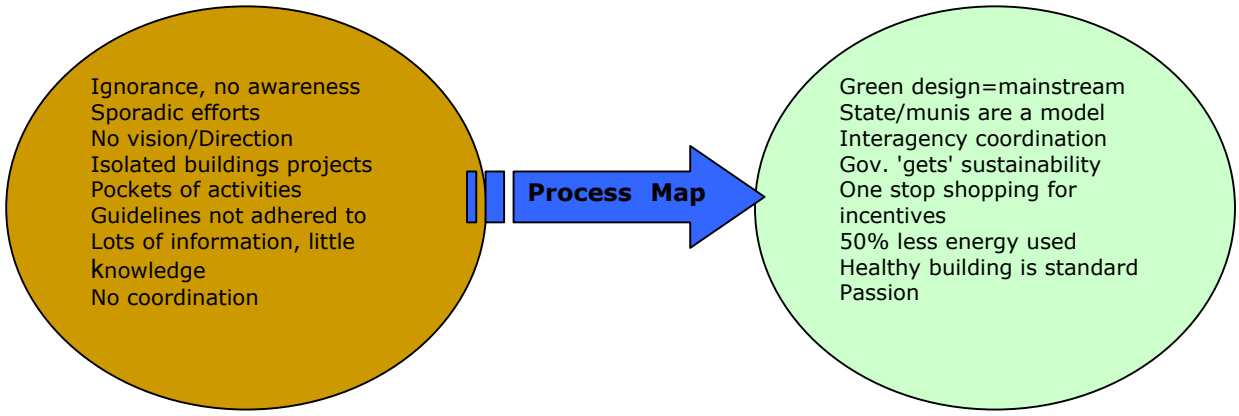
Process Map

The meeting reconvened after the smaller break out groups concluded their work. A representative from each working group reported on the ideas developed in their group. These topics were approached as smaller elements of an overall strategy.

The next step challenged participants to consider the big picture. They discussed the current state of sustainable design and ideal scenarios for the future. Following this, there was a short discussion about the process that would enable the Commonwealth to get from present to future. Creation of a Process Map that includes objectives, action items, resources needed and timelines may help guide this process. The map would summarize and synthesize each of the groups' efforts to date, as well as incorporate input from additional stakeholders as the process continues. This Process Map would be the basis of a strategic plan to achieve the goals of sustainable design in all public construction.



Next Steps: Sponsorship and Leadership

In the last segment of the day, the group turned its focus to next steps. Participants were asked to offer their commitment to potential and ongoing efforts. Commitment was defined in two ways: financial, to support ongoing work, and leadership, to identify people willing to devote time and energy to see these efforts through.

Sponsorship, both monetary and in-kind, was offered by the following organizations. (Note that this list is not comprehensive and does not represent the full list of commitments. Some participants had to leave before this discussion and others, who could not attend this meeting, conveyed their commitment for future continuation of this initiative.)

Division of Capital Asset Management
Executive Office of Environmental Affairs
Flansburgh Associates
MTC (Mass. Technology Collaborative/Renewable Energy Trust)
Turner Construction

The following organizations volunteered take a leadership role as this effort continues:

Architectural Resources Cambridge
B.S.A. (Educational Facilities Committee)
C.O.T.E. (AIA Committee on the Environ.)
Dept. of Education/SBA
Dept. of Housing and Community Dev.
Division of Capital Asset Management
DRA Architects
Executive Office of Environmental Affairs
Flansburgh Associates
HMFH Architects
Massport
SAR Engineering
Turner Construction

Next Steps: Immediate Actions

Participants offered ideas of next steps to continue this process:

1. Core Group Meeting
Define a group to organize, oversee and coordinate the activities of smaller working groups or focused committees. Draft a charter to define the roles and activities of the group. This group would also investigate/determine what other stakeholders should be involved (e.g. energy companies, utilities, etc.).

2. Sponsorship Meeting
Convene a meeting, or series of meetings to focus on the funding and resources necessary to complete this project.

3. Strategic Plan Development
Start the steps necessary to complete a Process Map and lock a strategic planning process into place.

4. Define Deliverables/Actions
This would include identifying deliverables such as: a data base of case study information, High Performance Design Guidelines for the Commonwealth, Performance Benchmarks, or actions such as legislative initiatives (to address the bid process), educational or training initiatives or the creation of incentive programs.

5. Grassroots Meetings – Statewide
Coordinate with groups across the Commonwealth and initiate an effort to increase public awareness and education about the impact of the built environment on natural resources and health, including watershed issues, energy and solid waste.

Conclusion

This Roundtable was an important first step in defining and promoting sustainability for the design and construction of schools and other public projects in Massachusetts. The day highlighted both the barriers present as well as the potential embodied in a comprehensive, inclusive approach. It was encouraging to see the level of enthusiasm and interest in the topic, as evidenced by the number of firms and agencies that were represented, the level of the representation within their organizations, and the quality of the concerns and information everyone brought to the table. The ideas generated provide an excellent basis for a strategic plan for the Commonwealth. The challenge is to capitalize on this momentum and begin working on the next steps.

Appendix A: Stakeholder Interview Questions

The following 9 questions were used as a template to frame conversations about green design in public buildings. About 20 stakeholders were interviewed representing an equal balance between private and public sector. Typically, interviews were an hour long.

1. Standard Background questions:
   Who are you, what do you do, how long have you been in your current role?
2. What is your perception of green design and construction?
3. What do you think of this project?
4. What do you see as some of the barriers to the design and construction of green schools and other public buildings?
5. What do you want to get out of this meeting?
6. Where would you like to see this process go after this meeting?
7. How do you think the public and private sector can better partner to facilitate the design and construction of green schools and other public buildings?
8. Are there are any key players that you think we should make sure to invite? Whose presence would make or break the meeting?
9. Anything else you think we should know before the meeting?

Appendix B: Brainstorming Session: Full Text

The following is the full list of perceived barriers as identified by participants in the brainstorming session:

- Lack of awareness – what sustainable design is and what it's benefits are
- Perception that it is always more expensive to design with sustainable strategies.
- Focus on programming space as a priority (over life cycle issues)
- The schism between Capital budget vs. Operation/maintenance budget
- Contractor/Subcontractor Qualifications
- Lack of follow through- Review & Process & Monitoring (to understand the impact of building operations financially and environmentally)
- Inappropriate payback expectations (short payback always more important – not considering other priorities)
- User groups have their own standards that have nothing to do with sustainability. (and do not understand how sustainable strategies can address their needs)
- Lack of public education
- Misconception that green building HAS to cost more, don't understand that any building can be made more green.
- Misconceptions of product performance (think 'green' products won't perform as well)
- Lack knowledge about building operations by design professionals and users.
- Risk aversion - Business as usual is safer even if it is wasteful or unhealthy.
- Lack of shared knowledge of case studies (transfer of lessons learned).
- Typical time/schedule and fees allocated do not allow for an appropriate design process.
- No qualifications/standards exist for sustainable design.
- It is difficult to quantify productivity and link to design.
- Construction delivery system is a barrier to high quality and integrated design process.
- There is a lack of enforcement of the current laws, never mind higher standards.
- No standardizing of protocols for measuring performance exist.
- Financial decisions are based on fact (unreliable data). We don't record the facts - needs to have a central point of reference. Historical, Database, need accuracy
- Deferred maintenance is a problem.
- No system of standards used – like implementing LEED™ and tying to SBA points for public schools.
- We don't use construction opportunities to model success (public buildings should be models).
- Political pressure from special interest groups.
- Lack of awareness about the enhanced productivity and improved air quality in green bldgs.
- Frustrating sense of "re-inventing" the wheel with each new project.
- Voters are unaware (of links between design decisions and impacts on environment, health and natural resources. Taxpayers vote funding and initiatives don't get voted in.
- No long-term monitoring of buildings exists, so we don't even know what were losing.
- No mechanism or system exists to coordinate projects (and integrate sustainable strategies - manual or template).
- Lack of incentives for high performance buildings (financial or other).
- Agencies don't know where to go for additional info and funding.
- Design professionals need more education on sustainable strategies, building systems and energy modeling.
- Disconnect between state's goals and translation to local municipalities.
- New energy code doesn't have energy budget.
- No way to learn from other (states) successes and transfer that to our state.
- Insufficient resources. Need to increase staffing (at SBA).

- Taking care of existing buildings – There is no ongoing analysis of systems that work/don't work, no audits of current performance or wasted resources.
- Lack of awareness of larger issues (sprawl, energy use, etc) – need larger community awareness in taxpayer population.
- Fear of developed vs. undeveloped land.
- No balanced assessment of systems - an understanding of balanced performance.
- Need more effective partnering between Public & Private sectors. lack of communication, need to avoid redundant systems, focus on adaptive re-use.
- RFP & Bid language inadequate (schools and other) Don't know how to use language to set expectations and get responses for green design.
- Specific problems inherent to construction - no process to screen low bidders - creating adversarial relationships between bidders - can't pre-qualify bidders.
- Under-funded studies and research - little analysis.
- No requirements for an efficiency (performance) standard to receive state funding. No award/bonus program tied to performance.
- Lack of proactive community 'circuit Rider' - communities don't have time or expertise to make decisions.
- Too much complacency - Need to get back to a sense of "urgency."
- Lack of qualified suppliers - systemic requirements impossible.
- Sitting on old landfills - lack of open space.
- No timely input - User agencies don't have info early enough in process.
- End users don't see the overall (externalized) costs in the long run.
- Wasted infrastructure - Need to focus more on renovation rather than new construction.
- Public doesn't understand the problems and need for sustainability for their own benefit.
- Competing concerns by different stakeholders. Conflicting priorities.
- Need to expand grants and incentives.
- No education about this in the schools - lack of curriculum based programs.
- Fear of implementing the obsolete. (evolution of technology).
- No way to effectively shared risk/liability between contractors/ all partners.
- Lack of support for life cycle decisions and processes.
- Not enough early commitment (and standardization) of rebate programs.
- Standard reimbursement rates for school construction not based on appropriate calculations, don't reflect real costs.
- Misguided value engineering and broader impacts on performance. Cost engineering of isolated elements, no bldg. System integration.
- Need for education for legislative leadership.
- Reliance on faulty infrastructure, assumptions that it is best solution.
- Not enough education and training for building managers and operators.
- Need to connect to passion for great building.
- Costs for high performance and building certification not included upfront.
- Fear of the unknown with new technology.
- Public misconception on public reimbursement. Need to educate cities and towns on state reimbursement.
- Language is a barrier. Green is "hokey." High performance is o.k.
- Already greatly excessive building cost/sq. foot (lack of awareness that it is unnecessary).
- We follow failed planning models of southwest. We don't focus on the big picture of sustainability.
- We are afraid of regulation.
- Conflict between smaller is better and economic efficiencies. Difficult to spread costs on small projects.
- Need for performance goals as opposed to prescriptive standards.
- Very little incentive to promote mass transit and connection to site choice.
- Need to quantify social benefits of green projects. Need to understand larger societal value.

- Need a more comprehensive outlook of life cycle costs and outcomes.
- Need to develop better communication channels between public agencies as well as between public and private sectors - central system?
- Lack of a widespread effort to bring "green" into mainstream practice.
- Inadequate communication: Don't know who has done what and how.
- Lack of leadership in this effort. Lack of a champion.
- Lack of publicity to provide incentives.
- Designer selection/teams not having clear and measurable criteria for selection.
- Some more $ needed for maintenance. May need regional maintenance funds to overcome deferred maintenance.
- Comparison of "true cost" of NOT being sustainable. (we don't understand externalized costs of current practices).
- Need of appropriate trained staffing in schools.
- The need for added design and lowered bureaucracy.
- Lack of Shared Knowledge (Case studies)
- Need standardizing protocols for measuring performance of new and existing buildings.

Commonwealth of Massachusetts Sustainable Design Roundtable

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